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Does Public Policy Crowd Out Private Contributions to Public Goods?

Abstract:
It is sometimes claimed that individuals' contributions to public goods are not motivated by economic costs and benefits alone, but that people also have a moral or norm-based motivation. A number of studies indicate that such moral or norm-based motivation might be crowded out, or crowded in, by public policy. This paper discusses some models that can yield insight into the interplay between economic and moral or norm-based motivation for voluntary contributions to public goods, and compares their policy implications. We distinguish between four types of models: Altruism models, social norm models, models of commitment and the cognitive evaluation theory.

Keywords: Private provision, altruism, social norms, commitment.

JEL classification: D11, H41, Q28

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1. Introduction

Everyday observation seems to indicate that individual behavior when dealing with public goods is not driven by economic considerations alone. Examples abound when one turns to environmental issues: In the Norwegian mountains, for example, there is an extensive network of cabins owned by the Norwegian Tourist Association. The cabins are placed approximately one day's walk apart, intended for hikers wanting to cross the mountains by foot. Many of these cabins are unmanned, but canned food and other provisions are available there. Anyone who pays her membership fee can use the cabins, leaving just enough money to cover the food she has taken and the price for using a bed. Nobody is there to control what she actually takes or pays, or whether she uses the facilities with care. Still, hardly anybody chooses to free ride. Moreover; between cabins, there are marked trails, to which access is perfectly unrestricted; but in spite of being extensively used, the environmental standard along the trails seems to be preserved to an astonishing extent. Although large numbers of tourists may pass through the area during a given period, making it virtually impossible to know in retrospect who actually kept their responsibility and who did not, the system has been working out this way for decades.

The well-known, but perhaps somewhat simple-minded *Homo Economicus* of undergraduate textbooks could hardly be trusted to such an extent. He wouldn't pay if he didn't have to, and he would presumably throw his trash anywhere if it bothered him to keep it. Further, he would not contribute more that the very slightest amount to charity; he would hardly recycle his household waste without economic incentives; and he would never volunteer for local community work.

In the economics literature, the simple model of *Homo Economicus* has been challenged many times. Different authors have suggested models in which individuals are not only motivated by economic costs and benefits, but also have a moral or norm-based motivation. In this paper, we will discuss economic models that can illuminate the following questions: Can public policy influence moral or norm-based motivation for contributing to public goods? And if so, is there reason to expect that crowding effects will differ between different policy tools? We will mainly focus on the policy instruments *government provision* and *subsidization of private contributions*.

A puzzling phenomenon in this field is that several strands of literature seem to co-exist almost in isolation from each other. Although they seem to analyze quite similar phenomena, citations between strands are rare, and definitions and central concepts frequently differ. Thus, our aim is to pull together

and compare some of these approaches; and then use them to discuss the two questions mentioned above. We do not aim for completeness, however, since this would be a nearly impossible task: Some of the strands of literature discussed here contains a vast number of research papers. In addition, there is an extensive literature which is relevant for our topic, but which does not explicitly discuss crowding-out or crowding-in effects of public policy.

According to how individuals' underlying motivation is modeled, we distinguish between four types of models describing moral or norm-based behavior: Altruism models, norm models, models of commitment, and cognitive evaluation theory. The distinctions between these are not clear-cut, but models within each group share some important features. As it turns out, different approaches yield different predictions concerning the possible crowding-out (or crowding-in) effects of public policy on individual contributions to public goods. Hence, the policy implications to be drawn from each model are also quite different. Empirical investigation of individuals' motives may thus be an important task for future research.

Below, we will first present the traditional simple *Homo Economicus* model as our reference case. In section 3, we will discuss *altruism* models, in which individuals take an interest in others' utility, their wealth, or their access to public goods. An extension of this is the *impure altruism* model (Andreoni 1990), in which individuals also derive utility from the act of giving. Substituting the pleasure of giving by a preference for social approval, we move into the domain of *social norm* models (e.g. Holländer ,1990) in section 4, which analytically seem close to the impure altruism model. Section 5 discusses what we have chosen to call *commitment* (Sen 1977), where simple maximization of individual well-being is supplemented by moral contraints on behavior. Finally, we discuss Bruno Frey's (1997) *crowding theory*, which is based upon cognitive evaluation theory from social psychology (Deci and Ryan 1985).

2. Homo Economicus

As a point of departure, let us establish the standard public good model, which we will refer to as the *Homo Economicus* model. Following Bergstrom et al. (1986), let us specify individuals' utility functions as

(1) $u_i = u_i(x_i,G)$ for all $i = 1, ..., n$

where x_i is individual i's consumption, G is the only public good, and n is the number of individuals. The utility function is assumed to be increasing and strictly quasi-concave in (x_i,G). In addition, both goods are assumed to be normal.

Assume that each individual's initial endowment w_i of the single consumption good is exogenously given. The individual can either consume this endowment, or he can contribute some of it, g_i, to the provision of $G = \Sigma_i g_i$. Thus, the individual's budget constraint is

(2) $\{x_i + g_i = w_i : \ g_i \geq 0, \ x_i \geq 0\}$

In a Nash equilibrium, the individual chooses how much to contribute by maximizing his utility, taking everybody else's contributions as given.[1] Assuming $x_i > 0$ for all i, this yields the first order condition

(3) $u_{iG}(x_i,G) / u_{ix}(x_i,G) \leq 1$ (= if $g_i > 0$) for all i.

Let $\hat{G}$ be the private provision of the public good determined by (2) and (3).

Any Pareto optimal allocation must satisfy the Samuelsonian condition (assuming side payments can be made costlessly):

(4) $\Sigma_i \, u_{iG}(x_i,G) / u_{ix}(x_i,G) = 1$

If $\hat{G} > 0$ and $(u_{iG} / u_{ix}) > 0$ for all i, then (3) and (4) cannot hold simultaneously.[2] Hence, the Nash equilibrium in this model is not a Pareto optimum. There is an under-provision of the public good. Andreoni (1988) demonstrates that, without public intervention, private contributions are always positive in the Nash equilibrium of this model. However, while G increases to a finite, positive value as n increases, the *average* contribution diminishes to zero. Moreover, the proportion of the population who contributes decreases to zero, so that only the very richest members of the economy contribute.

Governmental policies' crowding out of private contributions has been thoroughly studied within the framework of the model presented above. Warr (1982) and Roberts (1984) demonstrate that government contributions to the public good crowd out private contributions dollar for dollar. Similarly, Bernheim (1986) demonstrates that subsidizing contributions has no effect whatsoever on the equilibrium level of the public good. These results hold only for interior solutions. They all

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[1] Existence and uniqueness of Nash equilibrium in this model was demonstrated by Bergstrom et al. (1986).

[2] If $\hat{G} > 0$, then there exist at least one person j with positive contribution $g_j > 0$ such that $u_{jG}(x_j,,G) / u_{jx}(x_j,,G) = 1$. Then $\Sigma_i \, u_{iG}(x_i,,G) / u_{ix}(x_i,,G) > 1$ since $(u_{iG} / u_{ix}) > 0$ for all i. Hence, (3) and (4) cannot hold simultaneously.

presuppose that the government does not tax any single individual more than this individual would have contributed with no governmental intervention. If some individuals are taxed more than they would otherwise contribute, the equilibrium provision of *G* will increase (Bergstrom et al., 1986), but only by an imperceptible amount, as long as aggregate private provision is not completely crowded out (Andreoni, 1988). "The only way that the government can have any (significant) impact on the provision of public goods is to completely crowd out private provision. Joint provision is a veil" (Andreoni, 1988, p. 70).

3. Altruism

The predictions of the Homo Economicus model appear to be substantially at odds with empirical observations: As pointed out by Andreoni (1990), according to the these models, the Red Cross, the Salvation Army, and American Public Broadcasting appear to be logical inconsistences. Moreover, empirical studies (Abrams and Schmitz, 1978, 1984; and Clotfelter, 1985) indicate that actual crowding-out is incomplete.

The under-provision of public goods and the complete crowding out in the Homo Economicus model is not surprising, since Homo Economicus only takes into account the effects that his contribution has on himself, while disregarding the benefits that accrue to others. Intuitively, one might expect that replacing the Homo Economicus assumption by an assumption of altruism would solve the problem. However, the following will show that this is not necessarily the case.

3.1. Pure Altruism

In the literature, the concept of "altruism" has been analyzed in various ways. Following Hammond the utility function of an altruist *i* is given by:

(5) $$u_i = \hat{u}_i(x_i, G, u_{-i})$$

where u_{-i} denotes the vector of well-being of everyone in society except *i* herself. In this model an increase in the provision of the public good includes two effects on utility:

a) The altruist is better off because he has private preferences for the public good
b) The altruist is better off because he has private preferences for the well-being of people who have private preferences for the public good.

Hammond points out that for a given distribution **x** of the private good and a provison *G* of the public good, finding the individual well-being levels u_i requires solving the *n* simultaneous equations (5),

where $i = 1,...,n$. A given individual's well-being is only well-defined if this system of equations has a unique solution, which may not always be the case. Furthermore, this formalization requires that the utility functions are cardinal and interpersonally comparable.

Andreoni (1988, 1990) presents a simpler model of altruism. He defines a *pure altruist* in a public good model to be an individual with preferences represented by the utility function

(6) $$u_i = \tilde{u}_i(x_i, G)$$

In this model the consumer cares about the effect the public good has on the well-being of other people, i.e. $d\tilde{u}_i / dG$ includes the effect b) above, but he does not care about their consumption levels. In addition, the consumer can have private preferences for the public good, i.e. $d\tilde{u}_i / dG$ can include effect a) above.

Compare the altruist represented by (6) to Homo Economicus represented by (1). In the Homo Economicus model the term du_i / dG only includes effect a) above. Although the interpretation differs, Andreoni's pure altruist is formally equivalent to Homo Economicus. This implies that the results derived from the Homo Economicus model are valid also for the pure altruist model. Indeed, several of the papers referred to in the above section addressed the phenomenon of altruism explicitly, using the same "pure altruist" concept as Andreoni. Within Andreoni's pure altruism model, the application of Warr (1982), Roberts (1984), Bernheim (1986) and Andreoni's (1988) results are straightforward: There is an under-provision of the public good. Moreover, voluntary gifts to a public good are crowded out dollar for dollar by government grants, and subsidies have no effect. Thus, in similar with the Homo Economicus model, the pure altruist model implies results that appear to be counterfactual.

3.2. Impure Altruism

In both the Homo Economicus model and the pure altruist model it is assumed that preferences depend only on private consumption and the total supply of the public good. The counterfactual crowding out implication of such an approach led Andreoni (1990) to introduce his theory of warm glow giving. The idea is that one's own contribution to a public good produces a private good - "warm glow" - as a by-product of contributing to the public good. Andreoni refers to an individual with preferences for such a warm glow as an *impure altruist*.

The preferences of Andreoni's impure altruist is represented by the utility function

(7) $$u_i = \tilde{u}_i(x_i, G, g_i)$$

Notice that g_i enters the function twice, as part of the public good (via the assumption that $G = \Sigma_i g_i$) and as a private good. This reflects the fact that the impure altruist contributes to the provision of the public good for two reasons: First, he has private or altruistic preferences for the public good, and second, he has preferences for contributing to the public good in order to obtain warm glow. Thus, as apposed to a pure altruist, an impure altruist is not indifferent with respect to whom contributes to the public good.

By including one's own giving explicitly into the utility-function, Andreoni (1990) derives model implications that are consistent with observed patterns of giving. He shows that direct governmental grants financed by lump sum taxation only incompletely crowd out private donations. Furthermore, he finds that subsidies to giving can have the desired effect of increasing voluntary contributions.

An innovative experiment by Palfrey and Prisbrey (1997) supports Andreoni's theoretical analysis by showing that voluntary contributions in public good games can be explained by a warm glow effect from contributing. Moreover, an experimental study by Bohnet and Frey (1999) indicates that reducing the social distance between group members may reinforce this warm glow effect from giving. In their experiment members of each group have to look at each other in silence before they play the public good game. Such silent interaction among group members leads to significantly higher cooperation than complete anonymity.

4. Social Norms

In accordance with Coleman (1990, p. 242), we define social norms as rules of behavior that encourage people to behave in a certain way. Such norms are enforced by sanctions, which can either be rewards for obeying those norms or punishments for failure to obey them. Additionally, sanctions can be both social and internal. A sanction is social when one person sanctions another and internal when that person sanctions himself. A social sanction normally takes the form of approval or disapproval from others, whereas an internal sanction results in feelings of self-respect or guilt (Lindbeck, 1997).

Several economists have maintained that social norms can have an impact on economic outcomes. Akerlof (1980), for example, explain involuntary unemployment on the basis of social norms that discourage unfair wages. Lindbeck et al. (1999) analyze the effect of social norms telling people not to live on welfare. A number of authors have also argued that social norms might evolve and enforce cooperation. Arrow (1971) suggests that social norms can be interpreted as a reaction by society to

compensate for market failure in a public good game. In a Prisoner's Dilemma framework, Ullmann-Margalit (1977) argues that norms will evolve and constrain behavior such that players choose to cooperate. Douglass North argues in his book *Structure and Change in Economic History* (North 1981, ch. 5) that values inculcated by the family and schooling may lead people to restrain their behavior so that they do not behave as free riders. Binmore (1998), using the language of evolutionary game theory, suggests that social norms for reciprocity have evolved as a coordination device.

Holländer (1990) provides a formal analysis of social norms in a public good game. His approach is similar to Andreoni's (1990) impure altruist model. Instead of looking at warm glow as a by-product of contributing to a public good, however, Holländer (1990) considers social approval as a by-product. In Holländer's model, individuals' preferences are represented by

(8) $$u_i = u_{x_i}(x_i) + u_G(G) + u_{q_i}(q_i)$$

where q_i is individual *i*'s social approval. Individual *i*'s social approval is represented by

(9) $$q_i = a \cdot (g_i - \alpha \bar{g}) : 0<\alpha<1$$

where $\bar{g}_i$ is the average contribution in the society, and *a* is the approval rate. The approval rate, *a*, is the hypothetical benefit, measured in terms of the private good, that an individual would enjoy if all agents except him increased their contribution marginally. Thus, equation (9) reflects that an individual's social approval is positively correlated with how much this individual contributes to the public good compared to other people in society. Moreover, the social approval from contributing is felt more strongly the more people benefit from these private contributions.

By analyzing social approval as a by-product from contributing to a public good, Holländer (1990) shows that governmental intervention for the public good partially crowds out private contributions. Furthermore, he argues that such a policy results in a colder social climate that is not necessarily compensated by the welfare gain from allocating more resources to the collective good (Holländer 1990, p. 1165). Holländer does not analyze the impact of a public policy subsidizing voluntary contributions to the public good. It is, however, easy to show that his modeling framework implies that a governmental subsidy will increase voluntary contributions.

In line with Andreoni (1990) and Holländer (1990), Rege (2000) studies voluntary contributions to a public good, focusing on social approval as a by-product of contribution. Instead of simply assuming the presence of social sanctions, however, her paper provides an evolutionary analysis of the development of social sanctions enforcing social norms. The model has multiple equilibria, and may

thus provide an explanation of empirical observations that collective action sometimes succeeds and sometimes fails (see Ostrom, 1990).

Rege's evolutionary model has two asymptotically stable states: One in which a social norm for voluntary contributions is strictly enforced, and one in which no such norm is enforced. The intuition behind the existence of two types of stable states is that the social norm for voluntary contributions is conditional: The social approval an individual gets from adhering to the norm is positively correlated with the population share adhering to this norm. This correlation is due to the fact that only people who adhere to the social norm approve of other people's adherance. In Rege's model, a governmental policy analysis shows that subsidization of a public good may move a society from the stable state in which there is no social norm for voluntary contributions, to the stable state in which such a norm is strictly enforced. Moreover, a governmental policy contributing directly to the provision of a public good may move a society from the stable state in which a social norm for voluntary contributions is strictly enforced, to the stable state in which no such norm is enforced. Indeed, in contrast to Andreoni (1990) and Holländer (1990), this crowding in or crowding out prevails after policy reversal. Subsidies crowd in because they decrease the cost, in terms of reduced private consumption, of obtaining social approval. Governmental contributions crowd out because they increase this cost.

Note that there is no cost associated with sanctioning in the models discussed above. Coleman (1990) and Elster (1989) stress that sanctioning of others generally involves costs and that it is only in an individual's self-interest to sanction if the benefits of sanctioning exceed these. However, a contributor does not typically start yelling at a person who does not contribute. Instead he may quietly disapprove of the non-contributor and consider him as irresponsible. The fact that the non-contributor is conscious about this disapproval imposes a cost on him. He experiences the feeling of diminished social approval. The so-called sanctioner has, however, not intentionally made any effort to sanction him. (See also Brennan and Petitt (2000) and Loewenstein (2000)).

5. Commitment

In the Homo Economicus model, altruism models and the social norm models, individuals contribute to the public good to become personally better off. In what we have chosen to call *commitment models* this is not necessarily the case. Commitment opens up the possibility for personal sacrifice in a true sense of the word: An individual may make choices which indeed make herself worse off, by loyalty

or duty.[3] Sen (1977) distinguishes between *sympathy*, which appears to correspond to altruism in this paper, and *commitment*: "If the knowledge of torture makes you sick, it is a case of sympathy; if it does not make you feel personally worse off, but you think it is wrong and you are ready to do something to stop it, it is a case of commitment" (Sen, 1977, p. 95).

We know of no analytical commitment models in the economics literature analyzing whether public policy can crowd out, or crowd in, norm-based or morally motivated contributions to public goods. However, below we apply existing commitment models to answer this question. We will see that commitment models may imply different crowding effects than altruism and social norm models.

As Andreoni (1988), Sugden (1982) shows that The Homo Economicus Model and the pure altruist model cannot explain very common patterns of behavior in a public good game. Instead of modifying the utility function, as in the impure altruist model and the norm models, Sugden argues that it is necessary to drop the assumption of individual utility maximization in order to develop a more acceptable model. On this background Sugden (1984) introduces his theory of reciprocity, in which individuals pursue self-interest subject to moral constraints.

Sugden (1984) assumes that people act in accordance with a rule saying: "not that you must always contribute towards public goods, but that you must not take a free ride when other people are contributing". There is a limit to the duty; if others do not contribute, you don't have to be a "sucker". More precisely, Sugden states his *principle of conditional commitment* as follows: Let Q be any group of people of which i is a member. Let ξ be the lowest contribution to G provided by any one member of Q. Further, let i choose the individual contribution level g^* that he would most prefer that every member of Q should make. Then, if $g^* \geq \xi$, i has an obligation to contribute at least ξ. Thus, the moral requirement depends on a moral ideal (g^*), and what others do (ξ). The latter introduces interdependence between the individuals' choices, which as in certain norm models, gives rise to multiple equilibria. The nature of the interdependency between individuals' choices is, however, quite different than in altruism models: If someone else increased his contribution, an altruist would tend to give *less*; while in Sugden's model, this may induce the individual to give *more*.

[3] Note that this requires a distinction between utility, defined by revealed choice, and well-being (or some other measure of how well off the individual is). If the utility function is defined as a numerical representation of the individual's revealed choices, then making choices that reduce your own utility is a logical impossibility.

Sugden (1984) shows that there exist multiple Nash equilibria in his model, of which only one is Pareto efficient. In every other equilibrium there is an under-supply of the public good. If contributions have for some reason been established at a very low level, no-one will increase his contribution. As certain norm models his theory is thus consistent with empirical observations that collective action sometimes succeeds, but also sometimes fails.

Sugden's model does not explicitly include a public sector, and it is not obvious how this can be taken into account in order to study crowding effects. A crucial issue is how public policies affect individuals' perception of their moral responsibility, and thus the rule of conditional commitment. For example, if the government provides a substantial level of the public good, individuals may conclude that the government has taken over the responsibility for public good provision, implying a decrease of the "ideal" contribution g^*. This may crowd out voluntary contributions.

Also Nyborg (2000) presents a model of conditional commitment, assuming that individuals are committed to different roles in different contexts: In "moral" or "political" contexts, an individual may feel committed to take on a role as an agent for society, doing what she can to maximize social welfare; while in other instances, she acts as an agent for herself, maximizing her own well-being. Thus, the utility function, defined by revealed choice, can be represented by

$$(10) \qquad u_i = \begin{cases} V_i(v_1,...,v_n) & \text{if } C \in C^M; \\ v_i(x_i,G) & \text{if } C \notin C^M \end{cases}$$

where C is the context in which the choice takes place, C^M is the set of "moral" contexts in which i feels committed to be an agent for society, v_j is j's well-being as perceived by i, and $V_i(v_1,...,v_n)$ is a representation of i's normative views on social welfare. If the individual is faced with a similar set of alternatives while in different roles, she may choose differently according to which role she is in, since v_i may rank alternatives differently than V_i. Thus, the individual's utility function u_i may be intransitive.[4]

Nyborg (2000) does not derive any direct conclusions about crowding effects. However, if public policy can influence individuals' perception of their agency role (i.e. change the set of situations contained in C^M), her model suggests that public policy may crowd out, or crowd in, contributions to public goods in a model of this type. For example, introducing a payment to people who donate blood

[4] The idea of dual or multiple preference orderings has been advocated by several scholars, such as Harsanyi (1955), Mueller (1987), and Margolis (1982).

(Titmuss 1970) will unambiguously increase donations in the altruism and social norm models, since this is formally equivalent to a subsidy. Within the framework of a commitment model, however, the effect can be the opposite: If a donor believes that the government will secure the needed aggregate blood supply through price adjusments, her own contribution will in effect only replace someone else's. Then, she may think that she has no moral obligation to contribute, and that the decision of donating or not can be left to a private cost-benefit calculation. Thus, she may reduce or even discontinue her contributions altogether, if the payment does not cover her personal costs.

Brekke et al. (2000) propose a model which may be considered a synthesis between Andreoni's (1990) impure altruism model and a theory of commitment. Similarly to Andreoni, they assume that the individual derives a private benefit from her own contribution to the public good; namely an improvement in the individual's self-image as a morally responsible individual.[5] Self-image, denoted I_i, is determined through a comparison between the individual's actual contribution and her perception of the morally ideal contribution g^*. The best possible self-image is achieved when $g_i = g^*$. Like in Sugden's model, g^* is the contribution the individual would prefer every member of society to make. The individual identifies the morally ideal contribution g^* endogenously by maximizing social welfare (as she perceives it) with respect to g_i, subject to $g_i = g$ for each person i and j in society. *Actual* contributions, however, are determined through utility maximization, in which the individual will make a trade-off between her preference for a good self-image and consumption or leisure.

The individual will take the government's behavior as exogenously given when calculating the morally ideal contribution. This means that government policy can change individual behavior through its effects on g^*. Introducing a fee on those who do not participate in voluntary community work can actually decrease participation, provided that individuals think the fee is sufficient to buy the required services from professionals. If the fee is believed to be merely symbolic, however, such crowding-out will not occur in this model. Survey data reported by Brekke et al. (2000) is consistent with these predictions.

The model in Brekke et al. is not essentially a commitment model, since individuals are indeed assumed to maximize their own utility; hence it should perhaps rather have been included in the section on altruism. Nevertheless, the modelled preference for a good self-image is quite equivalent to a commitment to strive towards whatever is morally right: The benefits of a better self-image can only be obtained through a deliberate ethical judgement, followed by costly action. However, the model

[5] For a discussion of self-image in economic models, see Akerlof and Kranton (2000).

allows the individual to make a trade-off between the morally responsible self-image and costs in terms of reduced consumption or leisure.

6. Cognitive Evaluation Theory

A much cited theory of crowding out effects is Bruno Frey's crowding theory (Frey 1992, 1997) which is based upon the cognitive evaluation theory from social psychology (Deci and Ryan, 1985). In a number of articles, Frey applies his crowding theory to environmental morality theory (see e.g. Frey 1992, 1993, 1994, 1997, 1999, Frey and Oberholzer-Gee 1997). The generalization of this crowding theory to public goods in general is, we believe, straightforward.

Cognitive evaluation theory maintains that if individuals are given external incentives to perform a task they would have wanted to perform anyway, their intrinsic motivation to perform this task may decrease. Such crowding out will especially occur if the external incentives are perceived as controlling and have an effect on people's feeling of self-determination and competence. The cognitive evaluation theory is supported by a large number of empirical experiments (see Deci and Ryan, 1985, and Deci et al., 1998). This experimental evidence is, however, heavily attacked by some psychologists (Eisenberger and Cameron, 1996).

Frey (1992, 1997) assumes that some individuals have an intrinsic motivation to behave in an environmentally-friendly way. Drawing on the cognitive evaluation theory he argues that this intrinsic motivation might be crowded out by external motivation, such as economic incentives or direct regulation, because individuals will perceive this as controlling. The negative crowding-out effect may even be stronger than the positive effect of regulation. Green taxes may thus worsen the environmental quality. Frey also argues that some governmental policies can crowd in intrinsic motivation to behave in an environmentally-friendly way by increasing people's feeling of self-determination and competence.

A problem with Frey's theory when it comes to policy analysis is that it does not explain how different crowding effects are linked to specific policy instruments. For example, a subsidy on contributions may be interpreted as a signal that the government acknowledges and wishes to support individuals' environmental conscience. However, it may also be interpreted as indicating that the government distrusts individuals' environmental morality and believes that economic incentives is the only language they understand. As we understand cognitive evaluation theory, the former interpretation would crowd in intrinsically motivated contributions, while the latter interpretation would lead to

crowding out. Which interpretation individuals choose will presumably depend as much on the way a policy is presented as on which instrument the government decides to use. Thus, without more detailed information on the circumstances of each case, it seems hard to link the type of crowding effects discussed by Frey to specific policy instruments in a systematic way (for a discussion see Frey (1999) and Nyborg (1999)).

7. Concluding remarks

Substantial empirical evidence (see, for example, the surveys provided by Schram, 2000, and Frey and Jegen, 2000) indicates that individuals' contribution to public goods are guided by more complex motivational patterns than those implied by the traditional Homo Economicus model. While the simplest textbook models focus on economic incentives, moral or social norms also seem to be common and important motivational factors for individual behavior.

The main task of this paper was to answer the following questions: Can public policy influence moral or norm-based motivation for contributing to public goods? And if so, is there reason to expect that crowding effects will differ between different policy tools? In summary we have the following answers:

The Homo Economicus model implies that voluntary contributions to a public good are crowded out dollar-for-dollar by government grants or subsidies. Replacing the Homo Economicus model by a pure altruist (Andreoni, 1988), who takes an interest in others' access to the public good, gives a model which is formally equivalent to the Homo Economicus model. Thus, the results derived from the Homo Economicus model are valid also for the pure altruist model: Governmental grants or subsidies have no effect whatsoever on the equilibrium level of the public good.

In the impure altruist model of Andreoni (1990), individuals derive utility from the act of giving per se. A similar approach is taken in Holländer (1990), where contributing to a public good yields the by-product of social approval. In these models, governmental contributions will incompletely crowd out private donations to the public good, while subsidies may crowd in private donations to the public good.

The model of Rege (2000) is in many respects similar to those of Andreoni (1990) and Holländer (1990). However, she assumes that the social approval an individual gets from contributing is increasing in the contributions made by others, which leads to multiple equilibria. Hence, in addition

to the marginal effects discussed by Andreoni (1990) and Holländer (1990), public policy can in this model initiate a movement from one stable equilibrium to another, which may strongly amplify crowding effects. If the economy is initially in an equilibrium with strong social sanctions against non-contributors, public provision of the public good may in fact induce a movement to an equilibrium where no such norm is enforced, hence possibly crowding out private provision by more than one-to-one. Subsidies, on the other hand, have the potential of moving an economy, in whichno norm for private contributions is enforced, to a situation with social norm enforcement. Importantly, this crowding out or crowding in may prevail even after the policy has been reversed.

While the impure altruism and social norm models give somewhat mixed advice concerning the possible effects of government provision, they all predict that subsidies will crowd in private contributions. Within the framework of commitment models (Sugden 1984; Nyborg 2000), however, subsidies may change people's perception of their own moral responsibility, which may lead to crowding out of individual contributions. Although the commitment models discussed here does not explicitly analyze crowding out effects of public policy, it seems clear that this approach may modify policy prescriptions derived from the above models.

Like several of the other models discussed above, the model of Brekke et al. (2000) is based on a framework which is not very different from the impure altruism model of Andreoni (1990). However, the model also share certain features of the commitment models, since individuals have a preference for a self-image as morally responsible, which they can obtain by striving towards an endogenously determined morally ideal contribution. Brekke et al. (2000) show that introduction of a tax on non-contributors, which is equivalent to a subsidy on contributions, might under certain conditions reduce the morally ideal contribution, thus crowding out actual contributions. Hence, the conclusion from the commitment models, that subsidies has the potential of crowding out individual contributions, can be replicated in a framework based on utility maximization.

Frey (1992, 1997) develops a theory for crowding out of moral motivation, drawing on the cognitive evaluation theory of Deci and Ryan (1985). Although Frey (1999) provides some suggestions of how various policy instruments may crowd in or crowd out intrinsic motivation, the theory itself does not seem to be conclusive on this point. The crucial feature of a policy instrument according to Frey's crowding theory appears to be whether the instrument is perceived as controlling (in which case crowding out may occur), and whether individuals feel that the policy implies an acknowledgement of their intrinsic motivation (which may crowd in moral motivation). This will presumably depend as

much on the institutional context, and the way a new policy is presented, as on the actual choice of policy tool.

In conclusion, the economic literature on the relationships between public policy, moral motivation and actual behavior has expanded substantially in recent years. Nevertheless, in spite of a large number of impressive contributions of both empirical and theoretical work, the field still appears to be in its infancy. So far, there does not seem to be any universal answers to the questions posed in our introduction.

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